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Public Health and COVID-19 in Cities

CONTENT

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2020 has been one of the most difficult years for us all, with the rapid spread of the unfortunate COVID-19 pandemic. All of our schedules have changed, and most of our businesses and international travels have stopped. Once again, we understood the importance of public health as similar to all previous pandemics that humanity faced. Cities that already experienced previous pandemics/epidemics, such as MERS and SARS, have already been aware of the importance of public health, and managed the current pandemic with less severe outcomes, while it had more tragic results for cities and countries with a weaker public health system and lack of treatment facilities. As IGLUS, we are aware of how important the public health system is for cities to deal with this pandemic. Therefore, through this IGLUS Quarterly issue, we would like to touch upon the spread of COVID-19, and the successes and failures of public health systems in cities.

The issue opens with an article by Dr. Taner Zorbay providing a historical overview of pandemics and their impacts on world cities. It begins with a brief historical background of diseases that affected humanity. It then evaluates cities' performances against epidemic-diseases/pandemics and their consequences. The article ends with the current Covid-19 engagement in the world.

The second article is from the country of origin of Covid-19; China. Shahid Mehmood and Samia Seleemy provide a detailed overview of China's public health system and the performance of Chinese cities in the fight against Covid-19. They further touch upon the psychosociologic and economic effects of Covid-19 on Chinese cities and citizens.

The next article provides a detailed overview of the handling of refugees in the Athens metropolitan area during the pandemic. Edward Alan Bulut discusses the struggles and successes of the Greek authorities in preventing the spread of COVID-19 among refugees. The article also includes measures taken at the local/national level and faced with critics of non-governmental organizations.

The fourth article is from Seyi Akinlolu-Raphael, a public health expert. She discusses Nigeria's public health system by highlighting the successes and failures. The article also provides a specific focus on the health of slums in Nigerian cities. She further discusses Lassa fever and its eventual effects on public health.

The last article is about the success story of a well-governed public health system. Erva Özkan and Mücahit Varlı are providing an overview of how the Korean public health system has been successful so far to cope with Covid-19 by also considering the individual successes of Korean metropolitans. They also provide brief information on the impact of citizen participation and digitalization in combating the current pandemic.

We sincerely hope that you can enjoy the articles in this public health issue of IGLUS Quarterly. We invite you to join the discussion at iglus.org. If you feel there are innovative practices underway in your city/region and you would like to contribute to an upcoming edition of IGLUS Quarterly, we encourage you to contact us at umut.tuncer@iglus.org.

Numan Yanar

Cities and Diseases: Fighting the Invisible

Taner Zorbay

Author's Profile

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Introduction

When we were celebrating the coming of 2020 last December, no one could guess that we, the people of the world, would face a new pandemic disease called the Coronavirus disease, i.e. Covid-19. And since March of this year, as it was officially declared by the World Health Organization (WHO) as a pandemic disease, hundreds of researches, studies and papers have been made or produced all over the world. Politics, economy, security, and basic rights and freedoms of almost all nations are dramatically affected. World governments either limited or totally halted various facilities of daily life since March 2020. As of June, since the increase of the infected or the death toll seems to be gradually decreasing, daily life routines restarted in some countries of the world.

This paper aims at a general historical overview of pandemics and their impact on world cities. Starting with the definition of some terms related to the issue, as many people are confusing the definitions yet, this paper will continue with a short historical background of diseases that affected the world throughout the history of humankind. As the core of this paper, it will evaluate some world cities and their fight against diseases and its consequent results. Finally, this paper will end with the current pandemic engagement of the world, namely Covid-19. By means of this paper, hopefully we will be helping to understand the pandemic diseases and the necessity of cooperation in worldwide level both among the governments as well as people of different ethnicity, religions and regimes.

Definition and the Historical Background

A disease may occur in different forms and sizes. The extent or sphere of influence of a disease leads to definition and/or name of it. According to the English dictionaries of Oxford, and Cambridge, if a disease appears in a large number of people at the same time, and within a special time and as result of causes, it is called *epidemic*, originated form the Greek word *epi-demos*, i.e. upon or over people. If an epidemic appears or exists over a very large area affecting a large proportion of a population, in other word in almost all of an area or of a group of people, plants, and animals, it is called *pandemic*, originated form the Greek word *pan-demos*, i.e. all-people. To call a disease pandemic, it should be worldwide scale, not infecting or leading to death of people but also it should be infectious or contagious according to WHO and other respected health authorities. Covid-19, first appeared in December 2019 in China, and officially declared as pandemic by WHO in March 2020, became the last pandemic of the world, affecting more than 200 countries. Up to the present day, there were 21 pandemic diseases appeared on earth, and these were pandemic diseases of plague, cholera, influenza, AIDS, typhus, malaria, yellow fever, smallpox, measles, diphtheria, etc.

Throughout the history, pandemic diseases have appeared in different forms and affected millions of people across states and empires of old ages. Following some pandemic diseases, experienced in different forms of influenza and plague throughout the lands of civilizations of first ages and killing millions of people, the first pandemic outbreak was in the 6th century, when the Byzantine Empire, as the surviving part of the Roman Empire faced a bubonic plague, believed to travel from Central Asia. The disease resulted in not only huge human losses in the empire but also control of her sphere of influence. The result of this pandemic was of the loss of approximately 50 million people, i.e. 13% of world population of that time. Another and a worse wave of pandemic, again bubonic plague originated from Wuhan (China) and spread via Kaffa (Crimea) into the cities of Europe. On 14th century (1347-1353), the European continent lost about 60% of her population, and as a consequent spread of the plague it is believed that about 200 million people died, which was about 42% of world population then. Third pandemic wave, again bubonic plague, appeared in Yunnan (China) in 1855, and led to the death of about 12 million people in China and the Indian Sub-continent (CuriosityStream.com, 2020). Finally, it was Spanish Flue, between 1918-1920, that dramatically hit the world and resulted in the death of people up to 100 million. In the following years, humanity faced with different pandemic diseases, in various parts of the world resulting in deaths of millions of people (LePan, 2020).

As of March 11, 2020, with the official declaration of WHO, a new pandemic disease, called Covid-19, came to the scene. It first appeared in Wuhan (China), and then with no clear reason, it spread to world cities, killing thousands and leaving billions of people doubtful about their future. In level of governments, the reaction changes and thus impact of the disease differ from one country to another.

Diseases and the Cities

In this part of this paper, one will see some world cities and their fight against diseases and its consequent results. While choosing cities, I tried to cover world countries in the widest angle possible. The period covers a length from middle ages up to the present time. By this, one may understand how much the struggle against the pandemic was developed. Moreover, this section may support the idea of if there is a relation between spread of pandemic diseases and political or economic interests of world governments.

Plague of Athens was an epidemic appeared in 430 BC in Athens, when the city was in war with the city of Sparta during the Peloponnesian War. The outcome of it was tragic as it killed 75 to 100 million people, and spread from Piraeus, city's port and economic gate. It was these years that there was respect left among people to law, honor and religion, moreover the concept of diseases was under discussion (Holladay and Poole, 1979) like as the causes and impacts of the plague (Littman, 2009).

Plague of Sheroe was effective during the reign of the Sassanid Shah, Kavad II Sheroe (628) in mainly Asorestan province. The capital city of the empire, Ctesiphon, and the surrounding cities were hit by the plague, and this resulted in the loss of half of its population, including the Shah himself. Even the plague was named as Sheroe's Plague, and it is considered as leading to the decline and fall of the Sasanid Empire which was one of the biggest powers of the middle ages (Mark, 2020).

The Black Death appeared in 14th century in China and arrived in the city of Constantinople (today's Istanbul) in May 1347 with ships from Kaffa (Crimea). The city was the capital of the Eastern Romans since 395, and might have been considered as one of the leading trade centers of the world then. Thus, ships of merchants were warmly welcomed and no one would question what they carry besides goods of various cities. The Italian merchants carried the disease with their ships from Constantinople to the ports of North Africa, Italy and other European cities. The disease reached to Moscow in the east and to London in the west, killing about 50 million people, i.e. 60% of Europe's population. This experience was again showing the impact of trade and business in the spread of such pandemic diseases (Benedictow, 2005).

Cocoliztli Epidemic of 1545-1548 appeared on the Spanish newly conquered territories of in today's Mexico in the 16th century leading to death of mostly native people, estimated as 5-15 million, i.e. 80% of total population. The spread of disease became fast as the colonial social and hygienic conditions, as well as droughts of the time led to the disease (Acuna-Soto, et al, 2005, Vågene, et al, 2018).

The Ottoman Plague epidemic arose in Istanbul, the Ottoman capital, in July 1812 as another wave of plague epidemics since the 16th century. From the capital, the disease spread to other cities and regions of the empire, like Egypt, Greece, Wallachia, Bosnia, and Albania. The neighboring cities and states were also hit by the plague, Georgia, Crimea, Odessa, Moldavia, Ukraine, Malta, etc. According to the Ottoman records, about 300 thousand people of different ethnicities died as a result. Trade, business, as well as migration and settlement policies of the Ottomans and her neighbors, like Russian Empire, seem to be the leading causes of the spread of this disease (Robarts, 2010, Aksakal, 2003, Kotsiou & Michalaki, 2017).

1918 Influenza Pandemic (the Spanish flu) appeared in 1918 in different countries of the world. Caused by H1N1 Influenza A virus, it led to the death of people as high as 100 million in two years. European countries (Spain, France, Germany, UK), and the US cities were harshly hit by the pandemic. Though records and research results of spread of disease were censored by the Western governments of the time, except Spain, at the beginning, the international community learned about the real losses in the following years. Believed to be starting in Kansas (USA) on March 1918, the disease spread out to the world via either soldiers or war prisoners as far as, Mexico, South Africa, Japan and Australia by 1920. There are different approaches on the origin of the disease. Another wave of an influenza pandemic caused by H1N1 influenza virus was seen as late as 2009 again worldwide killing about 150-576 thousand people (Trilla et al. 2008, Rosner, 2010, Barro et al. 2020).

Covid-19 Instead of a Conclusion

It was on December 2019, that the first case of Covid-19 was reported in Wuhan, China. No later than 4 months, the disease, caused by SARS-CoV-2, spread to more than 180 countries in the world. On March 11, 2020, WHO officially declared it as a pandemic disease. As of June 2020, more than 10 million cases were reported around the world, leading to death of people around a half million. Not only daily routines of world states were affected by Covid-19, but also regional and international economic and political relations gone under an intense pressure (Novel, 2020).

As far as the recent reactions of world governments' show, it seems that the struggle with Covid-19 will continue for a while. Some countries like the ones in Scandinavia and the Baltic have not applied quarantine for Covid-19 whereas Mediterranean countries like Spain, and Italy enforced strict rules and limited daily life for their citizens. Countries like Turkey, on the other hand, partially applied quarantine rules and gradually lifts limitations on daily life. Although the number of people under Covid-19 threat is not much compared to the past centuries' diseases, the differences in policies and results of struggle seem to be affected by political and economic incentives (Velavan et al., 2020).

The history of pandemic diseases shows us that, viruses might be responsible for diseases. Yet it was usually economic and political motives that spread these diseases. The use of power in some world countries turned into an authoritarian way, and leaders of these countries use struggle against Covid19 as their excuse for violation of basic rights and freedoms. And many economically dependent countries feel more pressure from debt-providers with pandemic excuses. Moreover, the difference in reaction of local governments leads to difficulties in prevention and extinction of diseases. Instead of blaming other countries or regimes, world capitals surely need to cooperate in survival against global problems like pandemic diseases. To eradicate the reasons behind these dis-

eases, like malnutrition, overpopulation, illegal or forced migration, etc. countries of the world should bring their disagreements to a reasonable level. The developments in medicine, technology, and living standards in many countries might be hope promoting, yet many countries, especially those in the southern sphere of earth still faces crucial problems of underdevelopment. Thus, in brief, either we go hand in hand with all people of all nations or we suffer the devastating truth that takes out our beloved ones or ourselves one day, when we are still waiting for the cure or vaccine to be discovered.

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Covid-19 Outbreak in Chinese Cities: Psychosocial and Economic Impacts on Public

Shahid Mehmood, Samia Saleemv

Abstract: *In late December of 2019, 2019 novel coronavirus rose up out of Wuhan, China, and brought a considerable outbreak in large number of urban areas in China and spread comprehensively to almost all countries. Therefore, The World Health Organization (WHO) has affirmed an international public health emergency. The disease was formally named as Coronavirus Disease-2019 (COVID-19) by WHO. With the sudden and rapid outbreak, Chinese economy bluntly declined due to the shutdown of economical antiques and financial activities such as international trade, agriculture, and manufacturing industries. As a result, Chinese people faced a catastrophic situation and had socio-psycho-economical disturbances. By the assistance of digitalization and public participation, Chinese cities managed to avoid most of the negative consequences of the pandemic until now. This shows that the Chinese model in fighting the pandemic has comparatively been successful. Currently, there is no unequivocal treatment for COVID-19 albeit a few medications, and vaccines are under investigation.*

Authors' Profile

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Introduction

A novel coronavirus pandemic, namely Corona Virus Disease 2019' (2019-nCoV) is the fatal and deadly third-generation infection in Corona family following Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) in 2003 and 2012 respectively. After rhinoviruses, coronaviruses are considered as the primary and driven cause of the typical cold without active symptoms of any other diseases (Shereen, Khan, Kazmi, Bashir, & Siddique, 2020).

Considering the possible consequences of the pandemic, the World Health Organization (WHO) has affirmed an international public health emergency. After strict medical measures implemented by central and local provisional government, viral pandemic and transmission have been successfully controlled till now.

Essentially, the cause of the pandemic has been connected to a massive wholesale food shelter that is momentarily closed. However, the actual reason behind the re-spreading of the virus is still unclear (L. Wang, Gao,

Lou, & Zhang, 2020).

Changes in Public Health System of China

The People's Republic of China has made extraordinary accomplishments in improving its healthcare system during recent decades, because of the administration's commitment to health, and arrangement of a cost-effective public health system. In 2018, 25% of public health professionals in community health departments, and 42% of those in municipality health centers did not have a junior medical college degree (the prerequisite for an authorized associate doctors). These rates have been improved by the implementation of national graduate medical professional reforms in 2011 across the country. Professional education of physicians in medical school training has been organized in nationwide. The quantity of qualified family healthcare specialists in China has significantly been increased from 100 000 to 300 000. However, requirement for multidisciplinary healthcare professional groups still exists.

In the mid of February 2020, at the peak of the pandemic, 30,000 medical professionals were quickly dispatched from all over China and placed in Wuhan. Before the end of March, that number was expanded to over 40,000. As a result, intensive care medical staff in Wuhan reached to the 10% of the whole country (Li et al., 2020).

Furthermore, Leishenshan Hospital and Huoshenshan Hospital were allocated as infectious disease treatment units for COVID-19 patients. These two hospital for the pandemic were ready to serve in the first week of February 2020 (Yue et al., 2020). In addition, venues such as convention centers, gymnasiums and stadiums were converted into portable hospitals for the clinical observations and treatment of over 14,000 suspected cases, mild patients, and close-contacts of infected people. Also, the Chinese People's Liberation Army and some provisional medical networks progressively dispatched medical rescue groups to Wuhan city and the Hubei province to guarantee the sufficiency of medical assets in the epicenter of pandemic (Prem et al., 2020).

Changes in the governance of cities

Compared to the previous outbreaks, the expenses spent for COVID-19 are relatively higher. The greater part of the monetary expenses are because of the preventive measures and the transmission control strategies of the governments. As the pandemic has become a global issue, all countries are taking serious precautions to restrict the outbreak through social distancing policies by restricting the close contacts, shutting down the community organizations, constraining work and confining the human mobility. These actions had a quick and huge effect on all economies (Maliszewska, Mattoo, & Van Der Mensbrugghe, 2020).

Since the severe acute respiratory syndrome (SARS) revealed in 2003, the Chinese government executed the "Guidelines on Preparedness for the Response to Emergent General Health Hazards" with the goal of setting up a fast crisis reaction system and improving its reaction limit to lessen the level of epidemic calamity.

Wuhan city, the epicenter of the pandemic, is also the center of China's transportation network as it is connected to the most districts of China. (Park, Cook, Lim, Sun, & Dickens, 2020). Therefore, as the epicenter of the pandemic, Wuhan city originally declared a curfew by the government on January 23, 2020, and the isolation was extended to other cities in Hubei province, with the total population of 45 million. Since the asymptomatic incubation time of COVID-19 could be long up to 14 days, all inhabitants were confined to their homes for self-isolation. All public gathering spot such as schools, shopping centers, cinemas and cafés were shut down. In addition food, medication and clinical supplies were consistently provided to the people (Wu & McGoogan, 2020).

Economic impacts

Wuhan is considered as one of the major financial center of Central China. It is a trade and transportation center facilitating the headquarters of the large local steel and vehicle producers of China. The city is also the home of almost 300 manufacturing plants of the world's

top 500 organizations, including the software company SAP, Microsoft and car manufacturer PSA .

Wuhan's monetary development was recorded to outperform China's national development, with a GDP growth of 7.8% in 2019 as per the national average growth of 6.1%. After the spreading of ongoing viral outbreak, various companies had to displace their foreign laborers from the city and provisionally halted business activity. Among the businesses, retail and tourism industries are the most affected ones (del Rio-Chanona, Mealy, Pichler, Lafond, & Farmer, 2020). Shutting down of more than 70000 cinemas in China, airlines dropping inbound and outbound trips made the travel industry and different business exercises nervous. Currently, the economic impacts of the novel coronavirus are now reaching out the borders of the Hubei province.

During the SARS-CoV outbreak in China from 2002 to 2003, the worldwide economy lost $40 billion in total. Currently, China has 8 to 9 times bigger economy than the time of SARS outbreak, and is more associated with the rest of the world. Therefore, the total effect of 2019-nCoV on world economy has already been huge. China presently contributes 16.3% of the world's GDP. That's why, China has been considered as the biggest GDP trend setter among the world that IMF assesses that China alone represents 39% of the worldwide financial development in 2019. This indicates that partial stoppage of the economic growth of China could also send waves to other countries' economies as well. Therefore, economic impacts of COVID-19 on China, had huge impacts on world economy. Fig. 1 presents the development of China's GDP and its share on global GDP (Ayittey, Ayittey, Chiwero, Kamasah, & Dzuvor, 2020).

The business sectors abruptly dropped due to the extended Lunar Chinese New Year occasions. The benchmark Shanghai Composite Index fell 7.7% resulting in $375 billion loss in market. It has been the steepest one day decline since August 2015. The Shenzhen Composite likewise encountered an 8.4% decrease. Different business segments, retails, consumer administrations, and transportation stocks also had similar declines (Zhang et al., 2019).

Agriculture

The resilience of the agricultural sector has been tested by the COVID-19 outbreak. Demands from hotels and restaurants have seen a drop in prices of agricultural commodities by 20%. Self-isolation of the people in contact with suspected carriers of the virus has also an impact on the number of available inspectors and delivery staff to ensure verification and transportation of the products. This renounced the im-

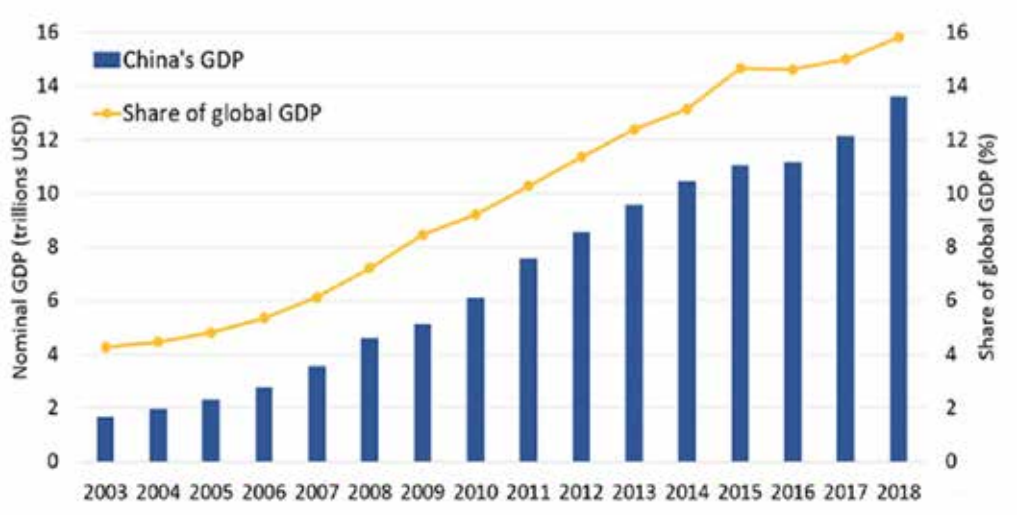

Figure 1. Growth of China's GDP and its shares in global GDP Source: World Bank, OECD (Ayittey et al., 2020)

plications for perishable goods such as meat and vegetables. Furthermore, the markets have gone a step further by shutting down floor trading which has impacted the ability of commodity exchange. The Chicago Mercantile Exchange is a recent example (Richards & Rickard, 2020).

Petroleum sector

Pandemic related crash of petroleum sector cannot be attributed to only China, as the de facto leader of Organization of the Petroleum Exporting Countries (OPEC) is Saudi Arabia. During the meeting at the OPEC in Vienna in March 2020, a refusal by Russia to slash oil production triggered Saudi Arabia to retaliate with extraordinary discounts to the buyers, and a threat to pump more crude were seen. Saudi Arabia heightened its provision of oil more than February by taking production volume to an unprecedented level. This caused the steepest one-day price crash that has been seen in nearly 30 years. As of March 23, Brent Crude dropped by 24% to 34/barrel to the stand at $25.70 (Albulescu, 2020). Although a slowdown in the number of COVID-related deaths has caused some stabilization of oil prices, there is still an uncertainty. On the background of a viral outbreak already dampening the demand for oil, this oil-price war is predicted to have grave implications for the global economy. In more ordinary times, cheap oil may have functioned as an advantage for the economies. However, savings on petrol are unlikely to be redirected into more spending as populations are instructed to practice social distancing. Therefore, the working class of oil sector is uncertain about job security. (Nicola et al., 2020). As China is the world's largest importer of crude oil and gas with the foreign oil dependency of 69.8%, these negative impacts of COVID-19 on petroleum sector affect China more than the other countries.

Manufacturing Industry

Even though the outbreak of COVID-19 resulted in huge drop of industrial production by 13.5 percent in January and February, it was recovered considerably in the following months. In July 2020, industrial production in China grew by 4.8 percent compared to the same period in the previous year (Statista, 2020). Even though manufacturing is getting accelerated in China, the weakening of external demand has the slowing down effect. The external demand inevitably shrank due to the COVID-19 pandemic. NBS senior statistician Zhao Qinghe declared that new export orders of some manufacturers dropped sharply, and even the orders in production were canceled. 57.7% of the companies declared lack of demand which will take them time to recover. Zhang Liqun from Development Research Center of the State Council also stated that new export orders sub-index shows that the pandemic's impact on the world economy, and international trade is putting a downward pressure on China's exports(China.org.cn, 2020).

Healthcare and the pharmaceutical industry

The COVID-19 pandemic has caused an unprecedented challenge for healthcare systems. In particular, the risk to healthcare workers is one of the greatest vulnerability. Considering most healthcare workers are unable to work remotely, strategies including the early deployment of viral testing for asymptomatic and/or frontline healthcare staff are imperative. High healthcare costs, and shortages of protective equipment including N95 face masks (95% selectivity for the particles with the size of less than 300 nm), ICU beds and ventilators have exposed. (Binnicker, 2020).

Albeit many industries have fallen because of the COVID-19 pandemic, the healthcare industry is still operating at full capacity in China. Investment in biological medicines and products increased by 15.1% and 10.5%, respectively. Alcohol for medical use grew by 24.8%, and the output of masks increased by 3.5 times. According to financial information service provider Wind, 270 listed companies reported profit growths of 82%, while 58 companies had drop of 18% from January to March.

According to Chinese Investment Bank Dongxing Securities, the pandemic brought a linkage to China's healthcare industry to reach international markets. That is, high production capacity of Chinese will be a helping hand to meet the worldwide demand for medical supplies such as masks, protective suits, monitors, and ventilators(China.org.cn, 2020).

Psychological impacts

In addition, previous studies indicated that infectious diseases especially epidemic, endemic or pandemic outbreaks of last few years such as SARS, Ebola, H1N1 flu

pandemic (2009 and 2010), MERS and equine influenza all caused negative psychological impacts on public. In this uncertain and developing scenario for COVID-19, it's not unexpected thing to see depression and anxiety on public with other psychological and emotional responses. Especially these psychological effects are expected to be more for healthcare staff, kids, patients with suspected infection, and quarantined family individuals, who are under physical and psychological tension (Xiang et al., 2020).

It is reported that psychological disorders especially depression, anxiety, fear and stress are seen more in epidemic areas due to the fear of to being exposed to the viral infection or the fear of death. A few investigations for SARS and H1NI in China also showed the evidences of psychological disorders especially anxiety, depression and stress of among the public (C. Wang & Zhao, 2020).

Post-psychological effects of COVID-19 are also critically expected. According to the previous epidemiological investigations, anxiety, depression, panic attack, psychomotor excitement, negative psychological effect, delirium, psychotic symptoms and even in severe cases suicidal inclination have been found among the recovered patients of the SARS epidemic. In addition, the vast majority of the recovered individuals have shown weak and disturbed mental, physical and psychological state (National Health Commission of China: NHC, 2020). These post-psychological effects are also inevitable for the recovered COVID-19 patients. Liu et al. (2020) indicated higher rate of depression (50.7 %), anxiety (44.7 %), a sleeping disorder (insomnia) (36.1 %), and stress related indications (73.4 %) (Liu et al., 2020). Even though these high rates may be because of the vagueness and little data about the COVID-19, such psychological disorders are still expected.

Conclusion

In addition to the direct impacts, mainly indirect effects of the pandemic were discussed in this article. One of the most critical indirect impact of the pandemic has been on economy. International trade, agriculture and energy industries were crucially affected from the pandemic. Furthermore, the psychological impact of the virus was also discussed above. The current investigation gives an understanding of the negative mental and psychological impacts of COVID-19 on public. Previous studies discussed above indicated that exposure to COVID-19 is comparatively not essential to create mental issues. It rather results in circumstantial psychological health disorder effects that can cause depression and anxiety. Psycho-socio economic instability made numerous individuals become mentally upset. The psycho-socio economic outbreak is increasingly articulated in Hubei province, where a significant number of the family members and friends of individuals have been exposed by COVID-19 that may result in death as well.

Even though, ultimate results of pandemic has been seen in China, early preparations based on previous experience of public health system of China led the country to take the control. In addition, digitalization also took an important place. Health sensors and apps have been used for tracking the millions of people on daily bases. In addition to the digitalization of the country, well-awareness of Chinese people on the seriousness of the situation was also helpful to cope with the pandemic.

As it is seen from the case of China for COVID-19, importance of strong public health system has been proved not only for controlling the direct impacts of pandemics on human health, but also coping with the indirect effects on economy and social life.

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Handling Refugees Amid COVID-19 Pandemic in Greece: A Case Study from Athens Metropolitan Area

Eduard Alan Bulut

Abstract: *While Greece struggles to cope with two major problems (i.e. massive government-debt crisis and migrant crisis), another unprecedented challenge, highly communicable coronavirus (COVID-19) disease, has arisen tripling her burden in early 2020. To avoid any undesired mass infection in urban areas, Greek authorities have taken extra responsibilities to offer effective community healthcare since the outbreak of COVID-19. Refugees have become a matter of concern during the viral pandemic from community health perspective thinking that overcrowding camps are at higher risk for contracting COVID-19. The measures taken at local and national level to protect refugees against the disease have been strict, which led to heavy criticism from some NGOs due to the over-capacity, poor water, sanitation and hygiene conditions in refugee camps. Despite deep concerns, the overall performance of Greek authorities in coping with COVID-19 has been relatively successful. Nonetheless, both national and city governments are well aware that things may reverse with new waves of COVID-19 transmission. Therefore, they urge caution.*

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Introduction

Greece is an effete country seriously hit by a massive financial turmoil. In addition, illegal immigration has been a major challenge for many years. The number of refugees in the country is unknown but it is certain that it follows an increasing trend. While Greece struggles to cope with these two major problems, another unprecedented challenge, highly communicable coronavirus (COVID-19) disease, has arisen tripling her burden. This new challenge has proved more complex than ever because it is invisible, as Mitsotakis, Greek Prime Minister, put in his television address (Kathimerini, 2020a). After seeing the devastating impact of COVID-19 in Europe, refugees have become a matter of concern from community health perspective. Insufficient accommodation capacity and severe sanitary deficiencies in refugee camps have fuelled these concerns more. To avoid any undesired mass infection both among the refugees and her local population in urban areas, Greek municipal and national authorities have taken on extra responsibilities to offer effective community healthcare since the outbreak of COVID-19.

The management of pandemic crisis has been tough due to continuous movement and relocations from islands to the mainland.[1] Moreover, continuing illegal immigration from other countries and the presence of unidentified/

[1] The number of refugees in the mainland Greece kept increasing even during the COVID-19 pandemic. To illustrate, almost 600 refugees were moved to the mainland on March 20. The Greek government decided to relocate 2380 refugees, mainly consisting of elderly people and vulnerable ones facing specific medical conditions, gradually to some hotels, apartments and camps in Attica region on April 16 (Kathimerini, 2020b). In early May, hundreds of refugees sheltered in the island camps were transferred to Athens (DW, 2020).

unregistered refugees in metropolitan areas have raised further difficulties during the COVID-19 pandemic. The main goal of this case study is to give some information about the activities of the Greek authorities to control COVID-19 among the refugees in and around Athens, the most populated urban area in Greece. This article does not cover the whole country, but roughly Attica region alone, excluding the cases reported from the scattered islands in the Mediterranean and northern regions in the mainland Greece. The time frame is limited to the period between February 26, 2020 (when the first COVID-19 case was officially confirmed by the Greek authorities) and May 25, 2020 (when the phase 4 of lockdown came into force). The data used in this article are mainly based on the field research and direct observation, which are well suited to the comprehensive study of social dynamics over time. Some reports issued by several supranational organisations, non-governmental organisations (NGOs) and newspapers are also used for documentation purposes.

Overview of tackling COVID-19 crisis

The total number of infection cases in Greece, as of May 25, has reached only up to 2882. Of them, 1637, *i.e.* 56.8 % of all confirmed cases, are reported from the Attica region alone. As for the number of deaths mainly caused by COVID-19 in Greece, it has risen to 172 throughout the specified period (EODY, 2020).[2] This death toll corresponds to 5.96 % of all cases. Statistically, Greece has one of the lowest figures of COVID-19 transmission in the European Union (EU). Given enormously high infection cases and extremely concerning death tolls in the EU member states, Greece has performed surprisingly well. Particularly, when her elderly population[3] and fragile economy which barely recovered from the notorious Greek government-debt crisis[4] are taken into consideration, it is possible to call it a true success story.

The above-given number of confirmed cases includes the refugees, infected by the novel COVID-19 virus, as well. Separately, the number of confirmed cases among the refugees living in and around Athens is 170. The first positive case of a refugee contracting COVID-19 has been a 19-year-old woman from Ritsona Refugee Camp,[5] where she and around 2700 other Syrian refugees are sheltered. She gave birth by Caesarean section in a public hospital on March 29. Following the labour, it was found out that the puerperant woman was infected with COVID-19, she was asymptomatic though. Contrary to expectations, the newborn infant tested negative for the virus. Right after this incidental finding, immediate tests in Ritsona camp on the next day revealed that 20 other refugees, showing no symptoms, had already contracted the virus. On April 2, the Greek authorities immediately put this camp under strict quarantine earlier in the day and did not let anyone leave or enter the quarantine zone without permission for at least fourteen days. It still remains unclear where and how this woman was contaminated. She was said to have contracted at the hospital which sounded like a poor assumption[6] be-

[2] The Greek Ministry of Public Health Social Care may keep a track of it internally; however, for an outsider, it is technically not feasible to give the exact number deaths reported from the Attica region alone because neither the official papers nor the newspaper did regularly share full descriptive details about the confirmed deaths during the given period. From time to time, the location of treatment or death was revealed in some newspapers; however, it does not apply to all. A great many of them remain unspecified because they are referred in the newspapers or official papers only as an accumulative number. Until and unless those details are revealed, it is impossible to track the location of all confirmed deaths. It may be a sort of data reserved for internal use only.

[3] According to UN Report on World Population Aging, 26.5 % of the Greek population is aged 60 years or over (UN, 2017). It has the second oldest population in the EU after Italy (Bouloutza, 2018)

[4] Ritsona Refugee Camp is 43 miles away in the north of Athens. It is mainly reserved for the Syrian refugees.

[5] Refugees in camps live in small circles and they do barely have private space. They have to share common areas together, which makes social distancing extremely difficult. Plus, they tend to hang around small areas in the city centre, too, such as Omonia, Vittoria Square, Acharnon, Metaxourgio, Syntagma Square, Amerikis Square, and Monastiraki, etc. Particularly in Omonia region, there is extremely close interaction between them all day and every day for commercial reasons. It is more likely that these places are the highly dangerous flashpoints for contracting the virus.

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cause the virus was detected after the labour at the hospital, and she was quarantined there. Test results from the camp showed that many others in her shelter had already been infected by then. The second positive case of a refugee was reported from the Malakasa Refugee Camp.[7] After an Afghan man, 53, tested positive for COVID-19, this camp was immediately quarantined by the Greek authorities for public health reasons on April 5. Similarly, strict quarantine procedures have been implemented in Malakasa. The third and last positive case of refugees was reported from a refugee hotel in Kranidi.[8] The history of this diagnose resembles to the first case. Showing no symptoms, a pregnant Somali woman, 28, was tested positive for COVID-19 in a local hospital during her ordinary visit. Shortly after her diagnosis, the Greek authorities took swift action and tested anyone, who might have had contact with this pregnant woman and other refugees sharing the same shelter, for COVID-19 comprehensively. 148 refugees,[9] none of whom showed any symptom of the disease,[10] were diagnosed positively. This time, unlike the first case, there was no assumption about the hospital as the possible location of contracting COVID-19 because immediate tests in her shelter, again, revealed that transmission took place long before. The refugee shelter was put under quarantine on April 21 collaborating with the security forces so that public health measures and quarantine procedures were applied as required. No more positive cases have been reported since then. All in all, the number of refugees, infected with COVID-19 in and around Athens, has increased up to 170. No new case has been reported from either any of these listed quarantine zones or other shelters in and around Athens. Likewise, there has been no death caused by COVID-19 among the quarantined or non-quarantined refugees, which is a noteworthy point to be appreciated. So, what did actually Greece do to contain COVID-19 in refugee camps and urban areas? How did the local authorities handle the quarantine zones?

Greek way of fighting COVID-19

The measures taken by the Greek municipal and national authorities have been strict and stringent because the situation is unprecedentedly serious and even life threatening. On March 22, a nationwide lockdown came into force restricting all movements. Despite the economic recession, this bold decision was taken when there were only 15 deaths from COVID-19. Whilst the lockdown halted nearly all activities, the authorities set to work mobilising a number of separate departments and units so that they can do their own share to contain COVID-19 as early as possible. The smooth cooperation between the national government and city government facilitated orchestrating multiple tasks and services simultaneously during the outbreak period.

As a part of sanitation initiatives, Athens Municipality has undertaken a tremendous task to disinfect urban areas frequently visited by refugees. Its sanitation department tends to run regular street cleaning operations in densely populated and frequently visited urban areas. Different from those operations, the municipal crews have started to use strong chemical disinfectants since the COVID-19 outbreak. On earlier days, professional teams sprayed and fogged chemicals to disinfect the air and environmental surfaces to prevent any contamina-

[6] MRefugees in camps live in small circles and they do barely have private space. They have to share common areas together, which makes social distancing extremely difficult. Plus, they tend to hang around small areas in the city centre, too, such as Omonia, Vittoria Square, Acharnon, Metaxourgio, Syntagma Square, Amerikis Square, and Monastiraki, etc. Particularly in Omonia region, there is extremely close interaction between them all day and every day for commercial reasons. It is more likely that these places are the highly dangerous flashpoints for contracting the virus.

[7] Malakasa Refugee Camp is 24 miles away in the north Athens. More than 1600 refugees with different nationalities are sheltered in this camp which already exceeded its initial capacity (i.e. 1000).

[8] Kranidi is about 51 miles away in the south of Athens. 471 refugees, mainly from African countries, are sheltered in Galaxy Hotel, temporarily converted into a migrant hostel.

[9] Of 497 people in the refugee hotel, 150 tested positive. 2 of them are not refugees. One of them is an aid worker and the other is a hotel staff. So they are excluded from this count.

[10] This is an interesting point open for further inspection. Except one in the second case, none of the refugees showed any symptoms. The infected were detected only by tests.

tion and transmission in and around the refugee settlements in Attica region. As of May 15, they started to follow the WHO's interim guidance specifically issued for this purpose, *i.e.,* Cleaning and Disinfection of Environmental Surfaces in the Context of COVID-19.[11]

The local authorities regularly delivered sanitizers to the refugees so that they can apply the recommended measures, *i.e.* frequent hand-washing, to avoid contracting COVID-19. However, ensuring personal hygiene in squalid environment has been difficult due to limited means. Poor water, sanitation and hygiene conditions have always been a major problem in camps. NGOs blame the Greek government for not complying with minimum preventive measures due to squalid conditions in the camps. However, they arbitrarily avoid making migrants a part of this accusation. The general sanitary conditions in Omonia, particularly Evripidis and Sofokleous Streets, or in Vittoria or Amerikis Squares where refugees tend to hang around in larger groups clearly show that they lack environmental awareness.[12] A great majority of them see their current environment as a temporary base where cleaning is not necessarily required. In brief, environmental awareness and cleaning is a burning issue where the level of collective responsibility is rather low.

Awareness and information about COVID-19 among refugees gained key importance because misinformation or assumptions can prompt clashes.[13] It was necessary to calm anxious refugees down psychologically. One of the crucial points in handling refugees amid COVID-19 pandemic is the recognition of refugees as a community. The Greek authorities have figured out this point earlier. They do not see refugees as a mass of independent individuals. Rather, they have noticed that there is indeed a dynamic community, the members of which are connected to one another through a strong network. They have their spokesmen and leaders to take the floor when necessary. To this end, the UN Migration Agency has collaborated with the local Greek authorities to figure out those community leaders. The primary goal is to increase the awareness about COVID-19 among refugees and inform them about how to stay safe both physically and psychologically. To avoid any possible panic fuelled by rumours and assumptions, a network of dialogue and information has been created using various means of communication, including tete-a-tete meetings, public service ads on television, mobile application service,[14] WhatsApp groups, etc. Besides, the Greek authorities have sent several COVID-19 alerts which are different from the ordinary alarm notices and warning messages. These alerts appeared on the mobile phone screen making a highly disturbing notification sound and vibration.

In the meanwhile, tracing patient zero became a key priority to curb further contamination. To trace patient zero and look at all possibilities, the local authorities tested numerous people who came into contact with the infected refugees. Pharmacists, supermarket employees, bank officers and couriers were not exempted. Tracing every individual systematically and testing them for COVID-19 in a big city require time, patience and complete dedication. The officers from the Ministry of Public Health and Social Care undertook this massive task.

Thinking that overcrowding camps are at higher risk for contracting COVID-19, the national government

[11] This interim guidance itself is short but it contains good information and helpful tips about the solvents and chemicals to be used for cleaning and disinfection (WHO, 2020).

[12] Athens Municipality washes these streets and squares early in the morning and collect the garbage scattered all around daily. They do this carefully because this quarter is right behind the City Hall. However, it has become their routine. Even if they clean twice a day, it becomes like a garbage dump again because migrant shopkeepers and their migrant visitors never see anything wrong when they pollute their environment. Direct interviews confirm their actions.

[13] Fear of COVID-19 outbreak caused violent protests in a refugee camp in Chios. After a refugee woman died in the camp, refugees in the same camp speculated that she died of COVID-19 (despite her negative test result) and destroyed many facilities.

[14] Mobile application service was used by the Greek authorities throughout the quarantine period to control movement in and between the regions. This service, which grants limited permission to move upon request, was praised by the OECD as the best practice to control the spread of viruses (OECD, 2020).

extended the restrictions in refugee camps until May 10. Later, they deemed it necessary to prolong the restrictions in refugee camps at high risk until May 21. Some NGOs did not welcome this decision and even labelled it discriminatory (Cossé, 2020). However, there is one crucial point ignored in such accusations. The Greek government introduced new restrictions recognising the fact that overcrowded camps are more at risk and the level of collective responsibility for community health and safety in urban areas is rather low. Any uncontrolled transmission in refugee camps can cause a big catastrophe and public health disaster in case of neglect. Based on this awareness, the Government kept applying its own method, which gave good results.

To this end, additional security forces have been deployed around the quarantine zones throughout the quarantine period. The police controlled the entry and exit of people and steadily monitored their area of intensified observation to prevent frequent sneaky escapes. The restriction of movement and isolation from the rest of the population was protested by the refugees. They attempted to violate the quarantine rules sneaking out of the quarantine zones. However, security guards responded to such escape attempts. Similarly, at the city centre, the police frequently patrolled the streets and urban open spaces to see whether people comply with the lockdown measures. Even on the highways to and from Athens, numerous police cars were stationed. Any unpermitted movement was heavily penalised, which was one of the disincentive measures.[15] In case of recurrence, Mitarakis, Greek Minister for Migration and Asylum, announced that refugees not complying with the quarantine rules would be barred from applying for asylum and might be deported out of the country (Kathimerini, 2020c).

The Greek government submitted a list of measures, to be applied in refugee camps to cope with COVID-19 disease, to the European Court of Human Rights (ECHR) on 27 March. The stringency of lockdown measures was heavily criticised by some NGOs, such as Human Rights Watch (HRW) and Doctors without Borders (MSF). HRW levelled criticism against the Greek authorities for locking down the refugee camp without any evidence of virus (HRW, 2020). However, this statement disregarded the fact that the camp residents had direct contact with the refugees who tested positive in neighbouring shelters. This situation itself was sufficient for the local authorities to apply quarantine procedures. Veizis, a representative from MSF, accused the authorities of irresponsibility for containing the refugees in refugee camps at higher risk (MSF, 2020). The underlying reason behind this criticism can be justifiable because overcapacity in refugee camps poses a big challenge to social distancing. Continuous overcrowding leaves refugees no option but to yield. Nonetheless, the local authorities managed something difficult indeed. In refugee camps where people live in packed spaces and cramped conditions, the infected were placed in separate facilities to make sure they have no contact with the other residents. The refugee camps were equipped with additional housing and sanitation boots, offered to Greece by the EU Civil Protection Mechanism as items of assistance to fight COVID-19 effectively (PubAffairsBruxelles, 2020). Besides, additional isolation units were established for potential cases and healthcare officers increased the frequency of medical screenings (Carassava, 2020). The infected refugees were put back to their camps after the end of their quarantine period. All activities in the camps were cancelled and the police did not allow any collective action or mass gathering, even for the minors. This is how the spread of COVID-19 was halted in those camps despite extreme overcrowding and heightened risk for contracting.

Challenges for urban governance and national authorities

HRW pointed out an important point regarding a major failure in Greece: proper identification of refugees

[15] The minimum amount was EUR 150 at the first instance. If repeated, a 5000-euro fine was applied to the violators.speculated that she died of COVID-19 (despite her negative test result) and destroyed many facilities.

with disabilities (HRW, 2017; HRW, 2018). Field observations show that this failure is not limited to the refugees with disabilities only. Huge masses of unregistered or unidentified refugees wander in urban areas idly without any official paper or permit. Their clandestine employment and accommodation makes their identification nearly impossible. A great majority of those unidentified refugees are employed in poultry and agriculture farms behind the scene, or engaged in works they have invented themselves, such as washing windscreens at traffic lights without asking for the driver's permission, selling flower or fruit in plastic bags standing on the highways, selling wristbands with ethnic motifs almost by force, pimping out women and boys for illegal prostitution, drug dealing, standover tactics on tourists,[16] and various types of theft, etc. Nearly all of those unregistered refugees live in densely-packed and extremely miserable conditions in urban areas. They are the foremost reason of community displacement, causing a drastic change in urban profile. Even in relatively richer and more distinguished neighbourhoods, such as Thissio, Kolonaki, Nea Smyrni, Plaka or Ilisia, there are masses of unregistered refugees living in damp and filthy cell-like basement chambers in large groups. It is possible to see some of these horrifying hideouts in disguise as a rehabber or buyer. They are like small versions of big refugee camps, albeit undetected, adrift and non-supervised. In other words, there exist many risk areas in metropolitan regions where safety and health measures fail. Extremely poor hygiene in urban refugee hideouts poses a potential danger to urban health making infections and infestations highly likely. In case of contamination, keeping a record may technically be infeasible. Even worse, tracing the patient zero can be impossible because search for an unregistered or unidentified person may yield no result. Thus, the situation out of the overcrowding camps is neither better nor pleasant.

Last but not least, unaccompanied refugee minors have always been a matter of concern in Greece because they are vulnerable to any kind of risk, including abuse and trafficking. To help them, a governmental programme, No Child Alone, was launched in November 2019 by the Greek Prime Minister. However, the outbreak of COVID-19 has deteriorated the situation and Greece decided to detain unaccompanied minors in police custody to protect them from COVID-19 and other risks temporarily.[17] This protective custody received harsh criticism from HRW, which later launched a new campaign, #FreeTheKids, to make the Greek authorities end this custody practice. As a result, neither the governmental initiative, *i.e.* No Child Alone, nor the non-governmental initiative, *i.e.* Free the Kids, received due consideration from prosperous countries in Europe.[18]

Conclusion

The overall performance of Greece in coping with COVID-19 has been relatively successful, even though it has been severely criticised for being excessively rigid. However, the winds may change direction and things may reverse. Both national and city governments are well aware of this probability and, therefore, they urge caution. Unexpected waves of COVID-19 transmission may occur anytime and anywhere. The increasing fluctuations in the number of COVID-19 cases in some countries, such as Germany, Japan, Iran, South Korea and Singapore, have recently shown that the *invisible enemy* can quickly turn the tide, regardless of their good performance.

Concerning the handling of refugees, Greece still has a lot to do. Priority should be given to the identification of unregistered refugees in urban areas for a more decent living by all means. Taking proactive decisions, the authorities need to detect urban hideouts where numerous

[16] Bullying and racketeering by the refugees has been on the rise. One of such acts caused the death of a Greek national in a central archaeological site (Antonopoulos, 2018).
[17] This is not a new practice. Previously, the European Court of Human Rights has found such protective custody practices unlawful (EDAL, 2019).
[18] As a showpiece, Luxembourg and Germany accepted only 12 and 47 children, respectively.

refugees take shelter in desperate conditions with great health risk. Otherwise, these places will be future flash-points for contracting any communicable disease which can threat public health. Putting such decisions requires more funding and technical assistance. The items of assistance offered to Greece are truly an asset. However, nearly all NGOs rightfully agree that there is far more need in overcrowding refugee camps. The volume of assistance to Greece needs to be increased to help her prevent the spread of COVID-19 among refugees in case of recurrence.

Sanitation and hygiene plays a key role in preventing contaminations. Cooperating with NGOs, the local authorities can organise public information meetings for refugees in order to expand their awareness about both personal and general sanitation and hygiene. Such sessions can be helpful to increase the level of collective responsibility among refugees in terms of environmental cleaning, public health and communal life in a foreign land.

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Health System, Approaches And Best Practices in Nigerian Cities: The Case of Lassa Fever

Seyi Jemima Akinlolu-Raphael

Abstract: *Nigeria has a population of over 206 million , with such a large populace and like most developing countries it experiences challenges in the health care delivery system. Over the years, there has been major epidemic outbreaks that has posed a threat to health and safety of cluster communities within urban cities and slums, therefore; it is necessary that city governance steps up to address the pressing need. Out of one of the endemic disease, Lassa Fever virus has caused reoccurring outbreaks over the last 50 years, the virus was transmitted through human's contact with infected rats. The year 2020 recorded the highest number of confirmed cases and fatality. Although higher surveillance measures and contact tracing have enabled city health officials to track the spread of the disease with more infected patients having access to treatments; there still remain the challenges of early detection and nosocomial transmission amongst hospital staffs and workers. Community campaign and media awareness for proper waste disposal and cessation of harmful health practices within prevalent city slums along with public and private funded research for the development of a vaccine might prove to bring an end to the reoccurring viral outbreak.*

Author's Profile

Seyi Jemima Akinlolu-Raphael is a public health advocate whose passions for public and environmental health has driven her to work with a number of non-governmental organizations as a volunteer and a consultant. She graduated from Ladoke Akintola University of Technology with a bachelor's degree in physiology, and also obtained a master's in public health from the same university. For over three years (2012–2016), she worked in the Bill and Melinda Gates Initiative in Nigeria to help combat the existing ignorance and lack of access to family planning facilities.

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Introduction

Nigeria has the population of 206,408,914 (DESA, 2019) and like most countries with a uniquely large citizenry, Nigeria has a developmental plan to manage and improve the health care system (Oyibocha et al., 2014). However, there is a clear disparity between plan and execution evident in the current reality of the country's health care system. Nigeria's health care system hinges on two platforms; the traditional and the orthodox medicine (Oyibocha et al., 2014). By virtue of increased education and knowledge, a higher percentage of people rely on orthodox medicine, thereby making it an essential component for health delivery services. The healthcare system is managed by both the public and private sectors. The government manages the public sector of health care delivery through 3 tiers; the federal (tertiary health care), state (secondary health care) and local (primary health care) government. Integration, information and resources sharing between the private and public health care system are poor. Over the years, there has been a rapid growth in migration from the rural to the urban areas. The overcrowded cities are grossly under-prepared for such influx; improper planning leads to inadequate provision of infrastructures, housing, and health care delivery services. A larger percentage of the populace live in city slums because of lower income opportunities. Poor quality housing, improper waste disposal and health practices create a breeding ground for pest and rodents consequently, serving as health hazards in the communities (Adebimpe, 2015)

Health Care System for urban slums and cities

Even though the urban cities and slums are saturated with many health facilities including the private owned and government funded centers, yet it does not translate into a quality health care. The hospitals and clinics often lack adequate equipment and facilities; typically, health facilities are understaffed, under equipped and chronically mismanaged. Inadequate funding makes poor remuneration for health workers causing them to be unmotivated. Predominantly, the masses cannot afford the cost of seeing a doctor because all the medical cost falls on the patient and his family. In the year 1999, government funded a new initiative designed to vamp the health system and reduce the out-of-pocket expenditure in turn ensuring that all citizens have access to the basic health care services. However, the National Health Insurance Scheme (NHIS) did not become fully operative until 2005 (Metiboba, 2011). Nevertheless, at best a few percentages have access to its benefit, the rest have to pay the full cost. In most situations, rural areas are saddled with only access to Primary Health Centers (PHC) and no access to private or tertiary health services. Although well intended, the centers are managed by the local government who get just a trickle of the government funding. One other challenge is that the facilities are often sited at the locations that are harder to access by the people who need their services the most. In some cases, a few PHCs offer good maternal care and child immunization though, many times it is because such facility has collaboration between external agencies; non-governmental organization, foreign sponsors or the government.

Health systems and epidemics in Nigeria

The health sector has had to deal with a number of epidemics over the years. While some diseases such as Lassa Fever, typhoid fever, cholera, tuberculosis, yellow fever, malaria to mention a few are still endemic and pose a threat to the wellbeing of multitudes; surprisingly, in the wake of the Ebola virus epidemic which swept through majority of west African countries between 2014-2016, Nigeria's response to the crisis was unprecedented and commended among the global community (Bell, 2016). The first case was reported in Lagos city, quick response was deployed by the city government to stop the spread of the disease, through public awareness, contact tracing and quarantine measures. Facilities were organized and skills employed to prevent an outbreak. There was a nationwide media coverage and health education. Safety measures were put in place and practiced among the populace, all these contributing to her success story. However, in the case of Lassa Fever, numerous private research funded by individuals and state funded universities have contributed to understanding the overall distribution of rodent species and cause of recurrent disease transmission (Agbonlahor et al., 2017).

The case of Lassa Fever disease

Description of the disease

Lassa Fever is a viral hemorrhagic fever which was first discovered in 1969 at a northern town in Nigeria when two missionary nurses fell ill and died from a febrile fever, a third nurse also developed severe symptoms and was immediately flown to a hospital in New York along with blood samples from the dead nurses). The samples were conveyed to Arbovirus research unit in Yale University where the team discovered novel virus from an isolated sample. Evidence showed an arenavirus originating from a class of rodents borne pathogens; the natural reservoir is a multimammate rat ubiquitous to west Africa. This particular specie is identified by its rows of mammary gland, its common habit usually in homes. Lassa Fever is contracted through direct contact with the excreta or urine of these rodents. In some regions, people consider rats to be a delicacy that makes them more predisposed to the viral infection. In addition, regular practice of bush burning by farmers during the dry season causes the rodents to scurry for shelter and food in nearby houses (Richmond & Baglole, 2003).

Due to recurrent outbreak of cases in various African nations, Nigeria been a key player; multiple clinical studies undertaken by the Centre for Disease Control provided relevant information about the clinical presentation of the disease. Early symptoms of Lassa Fe-

ver include; fever, weakness, malaise, retrosternal chest pain, headache, dizziness, vomiting, abdominal pain and tenderness, unproductive cough, sore throat and pharyngitis. These early symptoms are similar to other commonly treated illness such as malaria and thyroid fever, therefore; without adequate laboratory testing the disease might remain undetected. The incubation period of Lassa Fever is typically within 21 days but severity of symptoms is more evident between 7-18 days. Patients respond better to treatment at the earlier phase of incubation 1-6 days but very few come for treatment at the onset of the disease (McCormick et al., 1987). 20% of infected patients experience systemic hemorrhage and loss of hearing (Cummings, 1990). In Nigeria, Lassa Fever peaks in the first 12 weeks of the year during the dry season. However, evidence from some other country proved an overlapping of outbreaks between dry and wet seasons.

Lassa Fever situation report (current trend in Nigerian Cities)

The year 2020, experienced a surge in Lassa Fever confirmed cases which called for an emergency outbreak alert by the Nigeria Central for Disease Control (NDCD). While the world scrambled atop talks and solutions over the global covid-19 pandemic, the onslaught of Lassa Fever virus raged on with confirmed cases going up to 987 and a case fatality of 188 by 19 of April 2020. The cumulative suspected case was 4558 doubling the record of 2019.The earliest cases were reported in January steadily increasing until it reached its peak in April. However, by the end of April, NDCD announced an end to the emergency phase of the Lassa Fever outbreak (NCDC, 2020).

A second outbreak of exceptionally high case incidence and fatality occurred in 2018 (Ilori et al., 2019) ten years from the first one, since then, there has been a continuous rise in confirmed Lassa Fever cases for two years consecutively. Suspicion of emergence of a new strain of virus was feared to be the cause of rising infections but with evidence from viral genome sequence carried out by the CDC, such presumptions were dismissed finally, proving that the same strain of Lassa Fever virus was still in circulation (Kafetzopoulou et al., 2019).

Furthermore, reasons for higher cases of Lassa Fever could be as result of increasing surveillance and media's coverage; alerting and informing the masses of the diseases and provision of therapy (Ilori et al., 2019). Prior to 2008, blood samples and specimens of infected patients were sent to Europe and south Africa for diagnosis taking weeks and months, before cases could be confirmed and treated. However, due to the systemic testing undertaken at the designated facilities Lassa Fever confirmed cases of 1,637 (11.6%) was recorded among 14,168 patients with suspected Lassa Fever between September 2008 to August 2018. Of the 14,168 suspected cases 10,367 (73.2%) was from Edo state while 3,801 (26.8%) was from other states including the Federal Capital Territory, Abuja (Akpede et al., 2019). Conversely both states recorded 45.0% and 66% in 2017 and 2018 respectively. In 2020, records of emergency outbreak were high as 72% in Edo states and 32% in Ondo (NCDC, 2020). Although, this two states cumulate only to about 4.6% of the nation's population 74.6% accounted for the peak season from 2017 and 2018 only (Ilori et al., 2019).

An institute of Lassa Fever Research and Control (ILFR&C), was established in Irrua Specialist Teaching Hospital, Edo state, Nigeria in 2002 (Akpede et al., 2019; Asogun et al., 2012). This institute has been a major key player in the management and diagnosis of the LF disease irrespective of internal challenges. However, in spite of the institute, there were high case fatalities for Lassa Fever disease in 2003,2006 and 2016 respectively due to shortage of the viral drug ribavirin; the only treatment for the disease (Akpede, Asogun, Okogbenin, & Okokhere, 2018). By 2018, additional laboratories in Ebonyi, Lagos and Abuja were established for strengthening the surveillance level. Better standards of operating procedures were formulated; a fast response team provided support and capacity building to the affected states (Ilori et al., 2019).

Patients with less symptoms who initially would not have sought treatment now have access to treatment centers. For a couple of years, the federal government in conjunction with NCDC has contributed to free laboratory testing and treatment of Lassa Fever patients where viral drug Ribavirin and personal care commodities and

protective gear are supplied (Ilori et al., 2019). All these attest to growth and development in handling the outbreak. Unfortunately, much attention is not seen until the disease becomes an outbreak. This is because first line of treatment is usually the private or local hospitals; doctors do not have adequate equipment's or advance technology to diagnose and treat the patient. Hence, Lassa Fever disease goes undetected, festering within the communities. According to recent data, more nosocomial infections occur in hospitals either from undetected Lassa Fever patient or poor infection prevention practices.

Treatment of Lassa Fever is intensive, it includes daily doses of intravenous ribavirin, broad spectrum antibiotics treatments, managements of body fluid and electrolyte. Complications may arise with a need for hemodialysis. Before 2011, the only center for Lassa Fever treatment did not have the equipment for patients with the need for hemodialysis. Such individual could only be transferred to a certain private hospital in Lagos who had the facility and willingness to treat infected patients. A patent who goes into septic shock during treatments still does not have a chance for survival at the designated treatment sites as measures for addressing such complication are still evolving (Colledge, Walker, Ralston, & Davidson, 2010; Dongo et al., 2013).

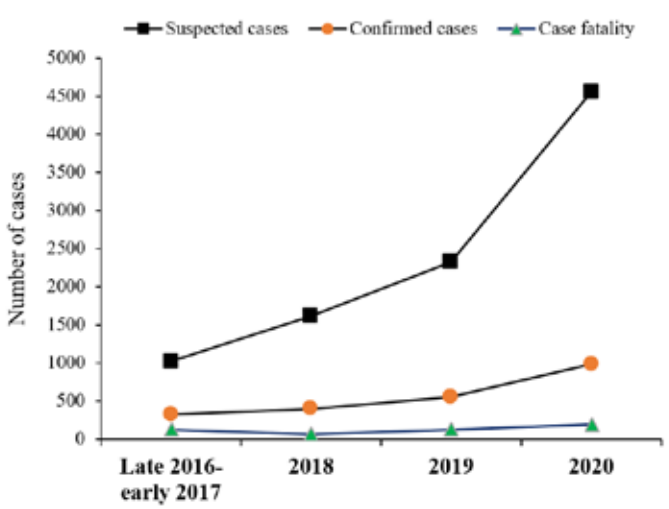

Figure 1. Current trends: Lassa Fever situation report. (NCDC, 2020)

Impact of Lassa Fever on urban life and slums, and resulting social challenges

The only treatment for Lassa Fever is viral drug ribavirin, an expensive drug that is not readily available in local clinics except special diagnostic centers and clinic designated for Lassa Fever therapy. This makes it almost impossible to be locally treated. A major factor that contributed to the success of 2018 going up to 2019 and 2020 was the ability of the government in collaboration with both local and international agencies to take care of the patients for free without any apparent financial cost. Irrespective, a person in convalescence would rarely be able to earn money, and in most cases lose their source of income after a lengthy period of illness. A few percentages of the urban population live in affluence and wealth. In Edo city central, one of the cities with high prevalence of Lassa Fever, a larger number of people reside in the slums. These slum dwellers are characterized by low level of education, income and occupation. These indicators make for certain choices in housing type, clothes, nutrition, food safety and health practices. The community is notorious for traditional autopsy, use of rat for food as a protein sources and forceful ingestion of water used to bath dead husbands by their widows. Corrupt practices by food vendors expose the food to disease carrying vectors (Inegbenebor, Okosun, & Inegbenebor, 2010).

Poor water supply, waste management and personal hygiene also contributes to the problem. Most people prefer to use the little water available for cooking and drinking instead of washing and cleaning. When people fall sick from exposures to Lassa Fever virus, the common practice is to self-diagnose, only when symptoms become unbearable do they sick the services of a physician. The local doctor is likely to diagnose malaria or typhoid, allowing the patient to reach terminal stages before suspicion of Lassa Fever disease thereafter referring them to a diagnostic center for treatments, by then hospital staffs would be compromised posing a risk to the community (Inegbenebor et al., 2010). Nosocomial transmission among hospital staffs reduce the work force and creates additional burden on the health care system. One severe symptom of Lassa Fever is temporary or permanent loss of hearing, as deafness is perceived as a

social embarrassment. Its backlash could be depression, anxiety and a lower quality of life. The economic effects of Lassa Fever are unprecedented affecting small businesses in slums and cities, individuals, families and the country at large.

Recommendations

More efforts geared towards funding of medical research and the development of vaccination against Lassa Fever virus would lead towards disease eradication. The country cannot depend on the international world to develop the vaccine, and it has received little recognition and funding from organizations. In cities, where the disease is most endemic, investment on case reporters and permanent surveillance measures will go a long way to curb the spread of the disease in addition with safety practices and infectious prevention measures by health workers in local clinics to ensure a reduction in nosocomial transmissions. Investment in community mobilizers and advocacy health officers by both the local and state government will create more awareness in the slums; advising them on safety food processing and practices in households and local business. Post control campaign and education on waste disposal and sewage management can effect significant changes in health outcomes. Reforms will ensure optimum resource allocation in places that need them the most. The responsibility of good health care does not only lie on the government alone. However, integrated environmental and community health approach make more sustainable measures.

Conclusion

Tremendous efforts on the part of stakeholders have been put forth to combat Lassa Fever virus in Nigeria's cities. Increased measure of surveillance on new cases and contact tracing, as resulted in more reported confirmed cases of Lassa Fever. Although, this may be due to the fact that awareness and campaigns in various cities about the disease have allowed people to seek treatments. More diagnostic centers have been built in the cities to ensure patients have easier access to treatment yet challenges still abound in terms of prevention control and bridging the communication and awareness gap between community slums members and health care service delivery. Provision of basic facilities and amenities by the city governance and safety health practices remain as the most important measures needed in the prevention and spread of the disease. Further research carried out by both private and public sectors will go a long way to fast track the creation of a vaccine hence reducing or eliminating outbreaks.

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Success of Public Health System in South Korea for Novel Coronavirus (Covid-19)

Erva Özkan, Mücahit Varlı

Abstract: *The pandemic of coronavirus (COVID-19), started in Wuhan in late 2019, has undoubtedly affected the near country, South Korea very fast. Korea, which is one of the first countries where the case is seen, managed to drop the number of daily cases compared to the other countries without enforcing a curfew process thanks to the national health system, technology, and public participation. The government and private sector have partnered for the rapid diagnosis of the patients. Necessary precautions have been taken by tracking and tracing systems through security cameras and payment systems, installment of rapid testing stations, and changing visa and travel practices. Korea has been indicated by the whole world as a successful example with the given response against the pandemic, even though the number of cases have increased again recently. However, the control of pandemic has never been lost. This article aims to summarize the successes of Korean government and cities, the struggles confronted, and the current situation.*

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Introduction

The pandemic of novel coronavirus (COVID-19) outbreak has led to notable challenges for all healthcare systems around the world. The health system of the most of the European countries and the United States have been focusing on individual care. However, the coronavirus pandemic enforced them to start taking actions about changing their public health systems as well. In this point, South Korea has been the role model of those countries with its foremost healthcare to the citizens and the immigrants.

Brief Introduction to the Public Health System of Korea

Korean Ministry of Health and Welfare offers a convenient and relatively economic public health system to all citizens. In 1977, compulsory health insurance was mandated. In addition to this, the health system was transited to universal health insurance in 2000. These two vital reforms made South Korea move to a better position in the public health system (Lee, 2020). Funding for this system is provided by mandatory contributions from the citizens and the government. Payments for health insurance are made by the individuals' employers. Therefore, National Health Information Center (NHIC) payment contributions are proportional to the economic strengths of the individuals. Furthermore, people with disabilities and people over 65 pay relatively less than the others do. The coverage of the insurance includes health check-ups, tests, diagnosis, treatments, surgeries, preventive care, hospitalization, nursing, reha-

bilitation, and transportation. (Angloinfo, 2020)

While the world has been hit by the COVID-19 pandemic, the Korean health care system has shown an optimistic approach by providing easy-access for the treatment for all patients. The test fee is free for many people, and the financial burden of the treatment has been minimized. Even though most of the hospitals are private, both private and public hospitals participate in NHI system with the same contract in accordance with the government-determined laws. (Kwon, 2020)

Novel Coronavirus and Its Spread in Major Cities of Korea

Although South Korea has been coping well with the spreading of the pandemic, the country is facing "a grave turning point". After confirming the first case, the number of cases had remained very low with no death. It had not been serious until the country had the 31st case in the mid of February. After this case, new cases were confirmed every day.

South Korea was already on alert for the virus, even though Corona cases come all of a sudden by clusters. The outbreak of the Middle East Respiratory Syndrome (MERS) in 2015 had a deep impact in Korea Centers for Disease Control and Prevention (KCDC). This has led to KCDC made several reforms on the health system for testing and abolishing any type of coronavirus. (Cho, 2020)

On January 20, 2020, South Korea reported the first case of novel Coronavirus. The patient was a 35-year-old woman who lives in Wuhan, China She detected with fever (38.3 °C) upon arrival at the Incheon International Airport. For the first four weeks of the epidemic, Korean Government managed the process more strictly with the previous MERS experiences and tracking/tracing system. (Kim et al., 2020)

As mentioned above, the turning point of the Coronavirus in Korea has started with the 31st case revealed in Daegu city. Patient No: 31 attended a religious activity, which had thousands of attendees. After that religious gathering, the number of cases steeply increased for the following days. Authorities began testing the attendees of that religious gathering. KCDC reports found out that 73 percent of all virus patients are connected to that gathering (Kasulis, 2020). The mayor of Daegu brought lockdown to all kindergartens and public libraries. Spring term in the school was delayed. In addition, k-pop concert that was arranged for Daegu was postponed (Yonhap, 2020).

While most cases in South Korea were originated from Daegu, news cases by clusters were also been reported in Busan. The Russian cargo ship docked with its crew was thought to have Corona symptoms anchored in the marina. The investigation revealed that 17 sailors were infected. For this reason, nearly 200 Korean dockworkers who had been in contact was quarantined (Kim, Arin 2020). In addition to these virus hotspots in Korea, new cases were also detected in Jeju, a tourist spot, and in Gwangju, one of the metropolitan cities of Korea. Due to the touristic and visa-free special status of Jeju, flights to Jeju were suspended for a while.

The Steps Taken by Korean Government for the Treatment of Coronavirus

In the first two months of the pandemic, the rapid increase in Corona cases led Korean government raise the red alert. Some public measures have been taken by the government by providing rapid testing availability and safe medical facilities without enforcing a curfew.

Korean government's response is based on stages such as; testing, tracking, tracing, and treating. Early and indiscriminate testing was the first key step to prevent the virus from spreading. Tracking the patients and tracing the people who had a contact with a patient enable authorities to keep the control of the pandemic.

Medical Supplies

The government has allocated more than $ 100 million to build medical supplies and isolation chambers, predicting that it will take many months to fight the pandemic. For the development of test kits, proactive consultation and cooperation have been made with the

private sector, and rapid diagnostic kits have been developed very quickly. Thus, South Korean health officials urged 20 medical companies to start for immediate development of a test kit for COVID-19. A week later, the diagnostic test was approved. The tests were subjected to many checks to verify that they were running at the time of their release. (Central Disaster Management Headquarters in Korea, 2020).

Public Measures

The other stage after the testing is tracking patients and tracing the people who had a contact with a patient of COVID-19. At this stage, the history of the patient`s movement is investigated. For this purpose, authorities collaborate with the local governments for the security cameras (CCTV) records, debit card records, and smartphone data to reveal the patient`s previous travel and contact history (Shin et al., 2020).

In addition to the intensive tracking and tracing process, the required brochures are distributed. Posters and advertising boards are used for promoting public measures to be taken. Hand sanitizers are provided to the public with free of charge in all public areas. The sale of masks is regulated under control of the government, and it was ensured that unfair earnings were prohibited. Social distancing is underlined, and additional measures were introduced to visa and residence permit policies. Furthermore, face-to-face education was replaced with online education.

Hospital Facilities

The Korean government has always underlined the importance of taking early precautions for the reduction of the spread of the virus. Therefore, easy access points to diagnostic tests have been established through the rapid test stations. These stations was designed in two different ways: pedestrian and vehicles. Currently, 23 public facilities, health institutions, 14 trust facilities provide diagnostic tests. (Central Disaster Management Headquarters in Korea, 2020).

There are numerous tests available across the country from drive-through tests to tests in the hospitals and local clinics, and they are mostly free. In addition, there are home visit options to take swabs for serious patients or elders that cannot go to the hospitals. Moreover, Korean government quickly developed screening stations to increase the access to diagnostic tests to detect confirmed cases, since intensive testing is a critical step in identifying the level of the infection in the country. This is a stepping-stone for making the hotspots of infection out, tracking down the people who may have been exposed, and tracing the population that contacted with those infected. (Park and Park, 2020).

Role of Public Participation

The painful memory of the MERS virus led to increased concerns when a new virus infection was reported. For the case of MERS virus, South Korea was the second country with the highest number of cases after Saudi Arabia. That experience kept great criticisms on the agenda for a long time. For this reason, after the new type of coronavirus was reported, Korea was already ready for most of the possibilities. (McCurry, 2020).

Even though no curfew was declared, people generally followed all of the warnings. The use of the mask in daily

Figure 1. Photos of diagnostic facilities (Source: Ministry of Health and Welfare of South Korea)

life was not a new situation for Korean citizens due to spring allergies and air pollution. Social distancing was also very well-obtained by Korean people to alleviate the COVID-19 outbreak in Korea. Although social withdrawal alone cannot prevent the spread of the disease completely, its ability to smooth out the epidemic curve reduces the burden on the health system and provides time to plan for the future steps. (Anderson et al., 2020). Also, as seen in the people of other big countries, there was no stocking or stacking of products in the markets.

On April 15, 2020, 29 million people voted for the parliamentary elections. Since the voting was maintained well, no infection spread occurred. "This is the power of South Korea and its people," said President Moon Jae-in. The success of the ruling party also showed that public agrees that the policies of the government was successful to control. (Kim, Stephen 2020).

Role of Digitalization

The solutions offered by high technology have always been trusted in Korea. In this point, arrivals to the airport are monitored by the government-led practice. In order to prevent the quarantine laws from being violated, obligatory monitoring wristbands are distributed to individuals. The Korean Government also mandated some ways to oversee the citizen`s movement in real-time GPS-tracking application. Additionally, some companies developed phone applications to announce the recent whereabouts of a coronavirus patients to provide health security to the folk. In addition, human density is determined by the CCTV systems at the existance points of the cases. (Aaron Holmes, 2020). The web pages that convey the number of cases in detail indicate the city and where the cases are located. New cases, mortality rates are transferred to these national web pages faster than the international system.

Digitalization was further effective for COVID-19 related educational changes. Undergraduate education throughout the country has been provided as online education throughout the fall semester. However, researches in graduate schools have continued in its ordinary way.

Thanks to the digitalization, shopping system in Korea was not also so much affected. Online shopping has already been widespread before the pandemic, and payments are made with cards without cash. Therefore, the pandemic period was not that difficult for the citizens to adapt to online shopping.

Conclusion

The experience of the MERS (Middle East Respiratory Syndrome) outbreak in 2015 had thought many lessons to Korea. In that epidemic, 36 people died. Thereupon, a strategy about infectious diseases was developed, and the Disease Control Center created a specific unit that carries out preparations for the worst possibilities. It was stated that these preparations play an important key role for the current pandemic. Experts believe that early detection with accurate tests and the resulting quarantine is crucial for reducing the mortality rate and the spread of the virus.

South Korea, one of the first countries where the virus was seen, has controlled the outbreak by tracing the contact histories of individual cases. Through the public's compliance with the warnings, the necessary measures has been taken quickly, and the use of technology has reduced the spread of the coronavirus in Korea. South Korea is one of the rare countries in the world that has mainly managed to control the coronavirus outbreak as of now. Korea's struggle with coronavirus has been illustrated by the world as an example, since Korea very-well handled the virus without enforcing any curfew, or stopping the businesses.

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